

Claims

I claim:

1. For use with a land vehicle, an air dam comprising one or more flexible deflector cells disposed adjacent to one another on an air dam frame that is mounted to an underside of the land vehicle, wherein the cells project from the underside of the vehicle into a space between the underside of the vehicle and the ground.

2. The air dam of claim 1 wherein each deflector cell can assume a stowed position and a deployed position; wherein when the cells are in the deployed position they project from the underside of the vehicle to form the air deflecting air dam.

3. The air dam of claim 2 comprising an actuator that selectively actuates the one or more deflector cells between the stowed position and deployed position.

4. The air dam of claim 3 wherein each deflector cell includes a flexible and generally cylindrical inflatable bladder that assumes the deployed position when inflated and wherein the actuator is a pneumatic system including a pressurized air supply and one or more air passageways that route air to the inflatable bladder to inflate the bladder to the deployed position.

5. The air dam of claim 2 wherein each deflector cell includes a steel wire spring that biases the cell to the stowed position in which the deflector cell curls up away from the surface on which the vehicle travels.

6. The air dam of claim 3 wherein the actuator moves the deflector cells to the deployed position based on vehicle speed.

7. The air dam of claim 4 comprising an outer impact resistant sleeve that surrounds the inflatable bladder of one or more of the deflector cells.

8. The air dam of claim 1 wherein the mounting frame includes nipples onto which the cells are press fit.

9. The air dam of claim 4 wherein the one or more air passages are internal to the mounting frame and are in communication with an air source and at least one mounting frame nipple.

10. The air dam of claim 9 wherein the mounting frame includes a plurality of air passages such that each air passage is in communication with a set of nipples.

11. The air dam of claim 10 wherein the set of nipples includes nipples that are adjacent to one another.

12. The air dam of claim 8 wherein an outer periphery of each nipple includes one or more barbs for engaging an inner surface of the inflatable bladder.

13. The air dam of claim 1 comprising one or more mounting frames, each supporting a bank of deflector cells.

14. The air dam of claim 13 wherein the mounting frame extends laterally across a front of the vehicle.

15. The air dam of claim 13 wherein the mounting frame is disposed on a bottom surface of the vehicle and has a generally ogival shape having a sharpness in the approximate range of 0.5-3.5 that originates at a front portion of the vehicle and radiates toward a rear portion of the vehicle such that the deflector cells route wind that encounters the vehicle between front and rear wheels of the vehicle.

16. The air dam of claim 13 wherein the mounting frame is disposed on a bottom surface of a trailer carried by the vehicle and wherein the air dam has a generally ogival shape having a sharpness in the approximate range of 0.5-3.5 that originates at a middle portion of the

trailer and radiates toward a rear portion of the trailer such that the deflector cells route wind that encounters the trailer between front and rear wheels of the trailer.

17. The air dam of claim 13 wherein the mounting frame is disposed on a bottom surface of a trailer carried by the vehicle and wherein the air dam has a generally ogival shape having a sharpness in the approximate range of 0.5-3.5 that originates at a rear portion of the trailer and radiates toward a front portion of the trailer such that the deflector cells route wind that encounters the trailer aft of the rear wheels of the trailer.

18. The air dam of claim 1 wherein the deflector cell comprises a flexible bladder connected to the air dam frame.

19. The air dam of claim 18 wherein the flexible bladder is sealingly connected to a nipple on the air dam frame with a circular clamp such that the bladder retains air present in the bladder at installation during impact.

19. The air dam of claim 1 wherein the deflector cells comprises a flexible sleeve connected to the air dam frame.

20. The air dam of claim 3 wherein the pressurized air source routes air exhausted from other vehicle systems to the air dam cells.

21. A method for deflecting air encountered by a land vehicle having a frame suspended above the ground by a plurality of wheels, the method comprising suspending a bank of adjacent flexible air dam cells between the vehicle frame and the ground.

22. The method of claim 21 wherein the flexible air dam cells comprise inflatable bladders and wherein the method further comprises the step of pressurizing air dam cells.

23. The method of claim 22 wherein the air dam cells are selectively pressurized by an air source when one or more air dam activation conditions occur.

24. The method of claim 23 when the one or more air dam activation conditions includes the occurrence of a vehicle speed over a threshold speed.